Space Weather Forecast

Issued on Thursday 7 November 2024 at 13:30 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity. Chance of further Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High, with an impulsive Strong-class flare observed at 06/1340 UTC from a large and magnetically complex region in the south-centre disc. There have also been numerous other Moderate-class flares, predominantly from the aforementioned region plus a new large region located in the far southeast of the visible disc.

There are currently nine sunspot regions on the visible disc. The three most actively flaring regions all lie in the southern hemisphere. In particular the regions in south-centre disc and far southeast appear to have complex magnetic configurations with slow growth evident in all. The remaining sunspot regions are smaller and more magnetically simple and generally either stable or in decay.

No Earth directed CMEs (Coronal Mass Ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds returned to background levels following a recent fast wind enhancement from a coronal hole. Speeds decreased from 460km/s to around 380km/s. The Interplanetary Magnetic Field was Weak throughout, with the important north-south component varying weakly between positive and negative directions. Geomagnetic Activity was Quiet (Kp0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate or High activity is forecast to continue, with occasional or frequent Moderate-class flares expected and a chance of further isolated Strong flares, with the regions located in the southern hemisphere considered the most likely sources.

Solar Wind / Geomagnetic Activity: One or two minor CME enhancements are possible at Earth between Days 1 and 2 (07-08 Nov) but with lower than usual confidence given they are modelled as glancing impacts, at best.

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Solar winds are currently at normal background levels. A weak coronal hole fast wind enhancement is considered likely later on Day 2 (08 Nov) or on Day 3 (09 Nov), with Slightly elevated wind speeds at peak. There is a chance for further possible fast wind influence to Slight elevated or Elevated levels on Days 3 and 4 (09 and 10 Nov) from a larger but much more southerly located coronal hole.

Geomagnetic activity is expected to be generally Quiet through Day 1 and early Day 2 (07 and 08 Nov), but potentially becoming Unsettled to Active with a slight chance of G1/Minor Storm intervals depending on any potential glancing CME influences. Between Days 2-4 (08-10 Nov) activity should be Quiet to Unsettled, with a chance of isolated Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a slight chance of S1/Minor Proton Storms or greater on day 1 (07 Nov), rising to a chance from day 2 (08 Nov) onwards as the significant regions on the facing-disc rotate into more geo-effective positions in the coming days

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	20	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	90	90	90	90
Very Active	R3-R5 (X Class)	Yes	25	25	25	25

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	20	20	25
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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